(12) PATENT APPLICATION **(11)** Application No. **AU 199953539 A1**
(19) AUSTRALIAN PATENT OFFICE

(54) Title
Fencing arrangement

(51)[7] International Patent Classification(s)
E04H 017/24 **E04H 017/14**

(21) Application No: **199953539** (22) Application Date: **1999.10.07**

(30) Priority Data

(31) Number	(32) Date	(33) Country
PP6408	**1998.10.08**	**AU**

(43) Publication Date : **2000.04.13**
(43) Publication Journal Date : **2000.04.13**

(71) Applicant(s)
Kerry Anthony Handley; Michael Hallion; Con Michalladis

(72) Inventor(s)
Kerry Anthony Handley; Michael Hallion

(74) Agent/Attorney
A.P.T. PATENT AND TRADE MARK ATTORNEYS,GPO Box 772,ADELAIDE SA 5001

ABSTRACT

Disclosed is a method of retro-fitting a modular fence, a fence panel and an adaptor for a fence rail. The panel includes two open hollow side rails, top and bottom rails into which is inserted respective adaptors, at least one sheet inserted edgewise by its periphery into the side rails and the adaptors. Each adaptor has restraining means to restrain movement of the adaptor within its rail and securing means to restrain movement of the sheet. The restraining means may comprise two elongate spaced surfaces that bear against surfaces of the respective rail. The securing means may comprise an elongate member projecting and biased towards the sheet which thereby bears against the sheet so securing it within panel. The method includes the steps of removing the top fence rail, removing the original sheet or sheets, inserting an adaptor into the top and bottom rails, inserting the new sheet or sheets edgewise into the adaptor of the bottom rail, and re-installing the top rail.

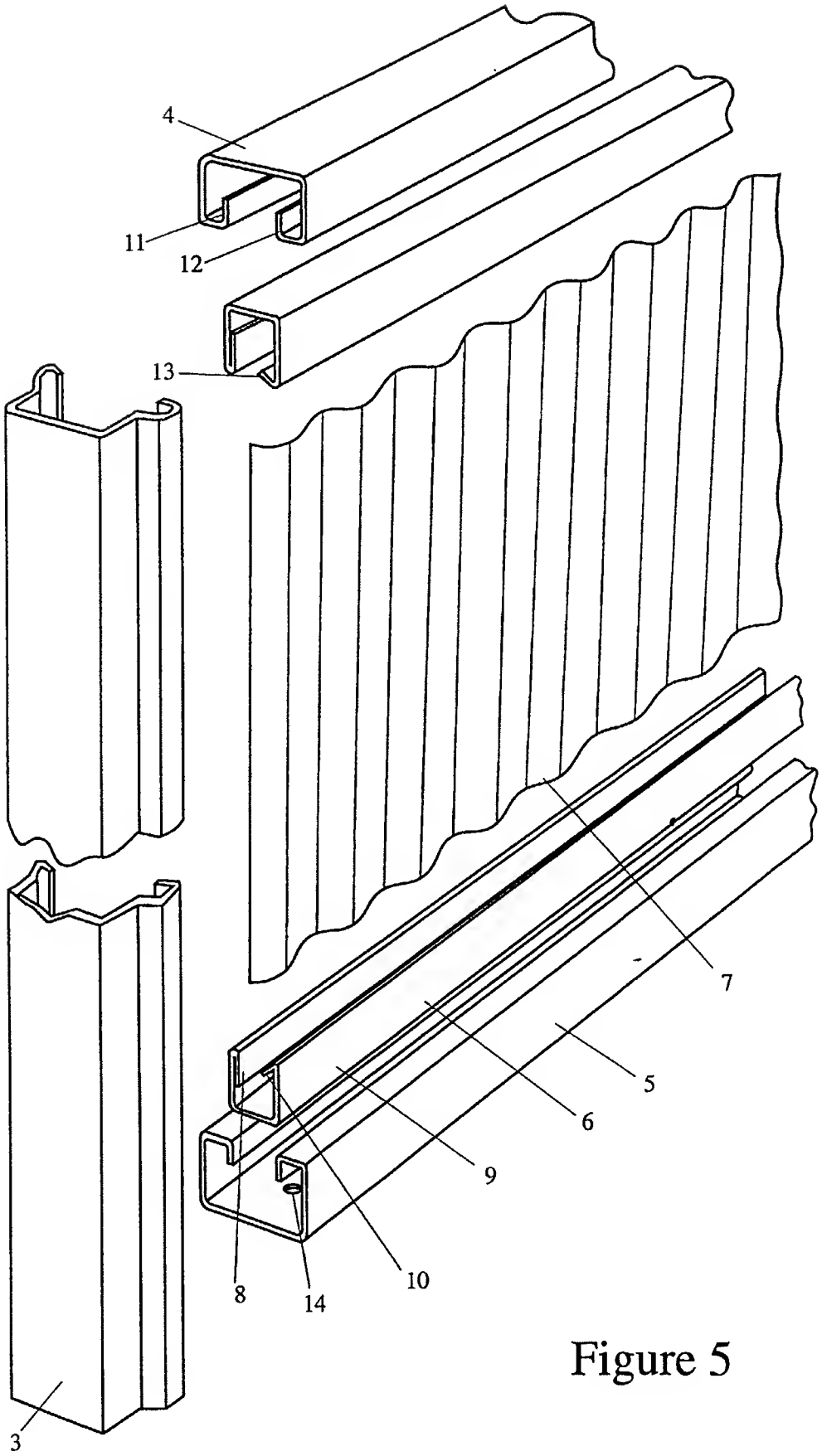


Figure 5

P/00/011
Regulation 3.2

AUSTRALIA

Patents Act 1990

COMPLETE SPECIFICATION

FOR A STANDARD PATENT
ORIGINAL

TO BE COMPLETED BY APPLICANT

Name of Applicant:	KERRY ANTHONY HANDLEY, MICHAEL HALLION and CON MICHALIADIS
Actual Inventors:	KERRY ANTHONY HANDLEY and MICHAEL HALLION
Address for Service:	**A.P.T. Patent and Trade Mark Attorneys GPO Box 772, Adelaide, SA 5001**
Invention Title:	FENCING ARRANGEMENT

Details of Associated Provisional Application No. PP6408 dated 8th October 1998.

The following statement is a full description of this invention, including the best method of performing it known to me:-

This invention relates to a fencing arrangement. The fencing arrangement is directed in one form to retro-fitting corrugated sheets to a panel fence.

BACKGROUND

Without intending to limit the invention to any specific modular fence type or any specific manufacture the invention may be used generally for a modular fence having a panel comprising a sheet or sheets about the periphery of which C or U cross section rails are placed and fixed together with the edges of the sheet or sheets within the rails. Typically there are four rails, one for the top, bottom and each end. The rails are typically made of steel and provide the structural support for the sheet or sheets between vertical fence posts.

Known fence panels have steel sheets that are roll formed and cut to desired lengths. In one form the profile of the sheets are angular and symmetrical about a centre plane which lies in the plane of the sheet. Thereby the sheet and so the panel has substantially the same appearance from each side. Accordingly, neither side of a fence made using such panels looks substantially different from the other. In another form, the profile of the sheets is non-symmetrical about a centre plane but in both cases unsightly posts and rails are not seen from either side being rather incorporated into the panels and overall fence.

Some people find the appearance of the sheets used in known fence panels unattractive and would prefer the more curved lines of a corrugated sheet fence.

Corrugated sheeting, sometimes called corrugated iron though it will be understood that it is not the intention here to limit the invention to only iron sheeting, is used extensively for roofing, shed walls, and fences. The shape of the corrugations is typically the same irrespective of the intended application. Further, whilst steel sheeting is very common other materials are formed into corrugated sheets and can be used together with or in place of steel corrugated sheet.

Unfortunately, the depth of the corrugations of a corrugated sheet is considerably smaller than the depth of the angular profile of known modular fencing sheets. Consequently, it has not been practical to fit corrugated sheets into modular fence panels or conventional rails since the sheets would only be loosely held by the rails leading to noise as the panels are blown in the wind and potential damage to the rails and sheets due to the effect of wind over time. It is proposed to alleviate this problem by use of an adaptor which shall hereinafter be more fully described.

Corrugated sheets have rounded profiles and this means that two slightly overlapping sheets rely on other means to secure one to the other. This has been previously achieved

by fixing the sheets to rails. Where the sheets are not so fixed then the sheets may move one with respect to the other.

Typically rails are formed with an elongate gap in a face into which corrugated sheets may be inserted. However, the resulting loose fit requires other fixing means to be employed. Making the gap narrower may not fully address this problem.

It has also been found that some prior fencing used rails of a gauge that is insufficient for a panel fence. Post and rail fences often had a rail spacing of about 1200 mm but panel fences often have the top and bottom rails spaced 1500 mm or 1800 mm or more.

It is an object of this invention to provide one or more of a fencing arrangement, an adaptor and a method of retro-fitting a fence to obviate or minimise at least one of the aforementioned problems, or at least provide the public with a useful choice.

SUMMARY OF INVENTION

Hereinafter the term "fence rail" will be used to refer to a fence rail of the type used at the top and bottom of a modular fence panel, is generally C or U shape in cross sectional profile and that a sheet is typically inserted edgewise into the fence rail. Also, hereinafter the term "sheet plane" will be used to refer to the general plane within which a sheet of a modular fence panel lies. Accordingly a fence rail has a sheet plane that is typically aligned with the elongate axis of the fence rail and projects normally from the open sided portion of the cross sectional profile of the fence rail. It will be appreciated that the defining of these terms is intended to facilitate explanation of the invention and not unduly to restrict the scope of the invention specifically to the application of fencing but to be inclusive of all applications where modular fence panels and the like find application. It will be appreciated that a panel may be in effect used after rotating by 90° such that, for example, corrugations run horizontal and the top and bottom rails mentioned above form the vertical edges of the panel. Obviously, a panel with this horizontal sheet orientation will still have vertical posts and horizontal rails with modifications to accommodate the change in sheet orientation.

The invention may be said to reside, not necessarily in the broadest or only form, in an adaptor for a fence rail, the adaptor having restraining means to restrain movement of the adaptor transverse of a sheet plane of the fence rail when the adaptor is inserted into the fence rail, and securing means to restrain movement of a sheet inserted into the fence rail within the sheet plane transverse the sheet plane.

Use of the adaptor allows a rail of a gauge that by itself is insufficient to be used in typically panels. The adaptor may take a number of forms and in one form is made of 0.6 mm steel which strengthens the rail into which it is inserted.

In the one form where the adaptors and the rails are made of steel, it has been found that combined rail and adaptors are not preferred for large panels since ease of manufacturing at a reasonable cost makes it preferable to use steel of a constant thickness. For a rail alone to have the required strength for a large panel then the thickness of the steel needs to be quite large at which the rail lacks the flexibility to be used as an adaptor. The adaptor needs to be insertable within the rail and also allow insertion of sheets. However, in one form the rail and adaptor are combined as further discussed below.

In one form the restraining means includes two spaced surfaces adapted to bear against two spaced sides of a fence rail. In a further form, the two spaced surfaces are opposed and are adapted to bear against two opposed spaced sides of a fence rail that are substantially parallel to the sheet plane of the fence rail. It will be appreciated that many forms can be used to make the adaptor including adaptors that are inserted axially into a fence rail and adaptors that are secured in place by means of fastenings. Some known fence rails are C shape in cross sectional profile with inwardly turned edges to the open side. These turned edges are used in a preferred form as the opposed spaced sides.

According to one form the securing means includes at least one elongate member parallel to an elongate axis of the adaptor that is biased towards the sheet plane of a fence rail when the adaptor is inserted into the fence rail and adapted thereby to bear against a sheet inserted into the fence rail within the sheet plane. The resiliency and biasing of the member or members allows them to flex as a sheet is inserted and press up against the sheet once in place. In this manner the sheet can be secured sufficiently for its use in a panel.

The adaptor in one form has a generally U shaped cross sectional profile, the restraining means includes two opposed spaced surfaces parallel to an elongate axis of the adaptor and joined by a web at one end and open at the other end, the two opposed sides being biased apart at the open end, and the adaptor being adapted to be inserted web first into a fence rail transverse of the elongate axis of the fence rail and with the two opposed spaced surfaces bearing against two opposed spaced sides of the fence rail that are substantially parallel to the sheet plane of the fence rail.

In one form the securing means includes at least one member projecting from a one of the two opposed spaced surfaces distal the web and biased towards the other one of the two opposed spaced surfaces, the member being adapted that when a sheet is inserted into an

adaptor inserted within a fence rail the member bears against the sheet lying in the sheet plane. If preferred both opposed spaced surfaces have projecting members. The biasing of the member allows the sheet to be securely held whilst still allowing some flexing. Further, the biasing also accommodates for variations in dimensions due to manufacturing.

In another form, the member also projects towards the web and thereby is adapted to resist removal of an inserted sheet within the adaptor. The member allows insertion of a sheet but retraction of the sheet causes the member to catch the sheet and so resist removal of the sheet from the adaptor. Also, by forming the member to project partly towards the web the exposed portion of the adaptor and a fence panel using such an adaptor have less sharp edges which may inadvertently cause injury to people, especially children.

In a further form the member or members each has a lip innermost of the adaptor which is bent over to present a rounded smooth edge to bear against a sheet. The rounded smooth bearing edge can lessen damage to a sheet during insertion of a sheet. For example, a sheet having a coated surface, such as COLOUR BOND (trade mark) corrugated sheets, may be damaged by a rough edge scratching the coating off the surface. This can lead to corrosion of the sheet so reducing its useful life.

The invention may be said to reside, again not necessarily in the broadest or only form, in a modular fence panel including an open hollow side rail at each side edge of the panel and a fence rail at top and bottom edges of the panel, an adaptor inserted within each the fence rail, at least one sheet inserted edgewise by its periphery into the side rails and the adaptors within the fence rails, the adaptor having restraining means to restrain movement of the adaptor within a respective fence rail transverse the sheet plane of the fence rails and securing means to restrain movement of the sheet transverse the sheet plane, and each rail being affixed to adjacent rails.

In one form the restraining means includes two spaced surfaces that bears against two spaced sides of the respective fence rail. Preferably, the two spaced surfaces are opposed and bear against two opposed spaced sides of the respective fence rail that are substantially parallel to the sheet plane.

In a form, the securing means includes at least one elongate member parallel to an elongate axis of the adaptor that is biased towards the sheet plane of the respective fence rail bear against the sheet.

According to one form, the adaptor is one having a generally U shaped cross sectional profile, the restraining means includes two opposed spaced surfaces parallel to an elongate axis of the adaptor and joined by a web at one end and open at the other end, the two opposed sides being biased apart at the open end, and the adaptor being adapted to be

inserted web first into a respective fence rail transverse the elongate axis of the fence rail and with the two opposed spaced surfaces bearing against two opposed spaced sides of the respective fence rail that are substantially parallel to the sheet plane. Preferably the securing means includes at least one member projecting from a one of the two opposed spaced surfaces distal the web and biased towards the other one of the two opposed spaced surfaces, and the member bears against the sheet. Also the member may also projects towards the web and thereby is adapted to resist removal of the sheet.

The invention may be said to reside, again not necessarily in the broadest or only form, in a method of retro-fitting new sheets into a modular fence panel for which the original sheets had a depth greater than the new sheets, the method including removing the top fence rail, removing the original sheet or sheets, inserting an adaptor into the top and bottom rails, inserting the new sheet or sheets edgewise into the adaptor of the bottom rail, and re-installing the top rail.

In another form, the invention may be said to reside, again not necessarily in the broadest or only form, in fence rail including an elongate gap for acceptance of an edge of a sheet, and securing means adapted to permit insertion of a sheet edgewise and cramp against the opposed sides of the sheet to thereby secure the sheet within the rail.

In a preferred form, the securing means includes at least one elongate member parallel to an elongate axis of the rail and is biased towards the sheet plane of rail and adapted thereby to bear against a sheet inserted into the rail within the sheet plane. The resiliency and biasing of the member or members allows them to flex as a sheet is inserted and press up against the sheet once in place. In this manner the sheet can be secured sufficiently for its use in a panel.

The rail in one form has a generally U shaped cross sectional profile having two opposed spaced surfaces parallel to the elongate axis of the rail and joined by a web at one end and open at the other end, at least one member projecting from a one of the two opposed spaced surfaces distal the web and biased towards the other one of the two opposed spaced surfaces, the member being adapted that when a sheet is inserted into the rail the member bears against the sheet lying in the sheet plane. If preferred both opposed spaced surfaces have projecting members. The biasing of the member allows the sheet to be securely held whilst still allowing some flexing. Further, the biasing also accommodates for variations in dimensions due to manufacturing.

In another form, the member also projects towards the web and thereby is adapted to resist removal of an inserted sheet within the adaptor. The member allows insertion of a sheet

but retraction of the sheet causes the member to catch the sheet and so resist removal of the sheet from the rail.

In a further form the member or members each has a lip innermost of the rail which is bent over to present a rounded smooth edge to bear against a sheet. The rounded smooth bearing edge can lessen damage to a sheet during insertion of a sheet.

According to another form the rail includes drainage holes adapted such that when the rail is lowermost in a panel water collecting in the rail may drain therefrom.

DESCRIPTION OF PREFERRED EMBODIMENT

To assist in the understanding of the invention preferred embodiments will now be described with reference to the accompanying drawings:

Figure 1	illustrates a fence panel;
Figure 2	is a series of views of the fence panel;
Figure 3	is a cross sectional view along AA';
Figure 4	is a cross sectional view along BB';
Figure 5	is an exploded view of the parts of the panel;
Figure 6	is an exploded view of the parts of the panel showing the second embodiment of the adaptor;
Figure 7	is a series of sketches illustrating a further embodiment applied to octagonal profile rails;
Figure 8	is a sketch of a panel with horizontally running corrugations; and,
Figure 9	is an exploded view of a panel according to a further embodiment.

It will be appreciated the accompanying drawings are sketches and not intended to be photorealistic. The same reference numeral will be used throughout the drawings to refer to the same feature.

In Figure 1 the first embodiment of a modular fence panel (1) is illustrated in a perspective view. The fence panel includes an open hollow side rail at each side edge of the panel (2 and 3) and a fence rail (4 and 5) at top and bottom edges of the panel. An adaptor (6) is inserted within each of the fence rail. At least one sheet (7) is inserted edgewise by its periphery into the side rails and the adaptors within the fence rails. The adaptors have restraining means (8 and 9) to restrain movement of the adaptor within a respective fence

rail transverse the sheet plane of the fence rails and securing means (10) to restrain movement of the sheet transverse the sheet plane. Each rail is affixed to adjacent rails to secure the panel as a whole.

The fence rails are made of steel C section approximately 60 x 40 x 1 mm and is best seen in figure 5. The fence rails have lips (11 and 12) turned inward leaving an open gap of about 30 mm width. The side rails are also made of steel that has been roll formed into the shape shown and being approximately 65 mm wide across the closed end and 90 mm wide at the open end. The modular fence panel is approximately 2.4 m long by 1.5 m high though other sizes could be made. The fence panel is intended to mounted to suitably spaced posts.

The adaptor is made of roll formed steel 0.6 mm thick that is cut to suitable lengths. The adaptor is generally U shape in cross section as best seen in figure 5. The base of the U is approximately 30 mm in width but sufficiently narrow to fit snugly within the gap of a fence rail. The sides of the U are about 40 mm long.

The restraining means is formed by two spaced surfaces being the outer surfaces of the sides of the U of the adaptor. These are adapted to bear against the two opposed spaced sides of a fence rail that form the lips that are substantially parallel to the sheet plane of the fence rail. In this manner the snugly fitting adaptor is restrained from moving transverse the sheet plane of a respective rail. This is convenient but other forms may be used if desired. The profile of the adaptor may be shaped to fit within the fence rail between the internal sides of the main vertical walls as compared with the lips. This form would require sliding the adaptor into the fence rail from an end rather than simply between the lips of the fence rail. Further the adaptor may be restrained by a fixing means such as a screw if preferred but this is not the preferred manner since it requires time and screws when compared with the preferred embodiment.

The securing means includes at least one elongate member (13) parallel to an elongate axis of the adaptor that is biased towards the sheet plane of a fence rail when the adaptor is inserted into the fence rail. The member is about 10 mm long and angle at about 45 ° to an adjacent side of the U of the adaptor. The member bears against a sheet inserted into the fence rail within the sheet plane and so secures the sheet within the fence panel. The biasing of the member allows the sheet to be securely held whilst still allowing some flexing. Further, the biasing also accommodates for variations in dimensions due to manufacturing. Also the biased nature of the member allows a sheet to be inserted into the adaptor but resists removal of the sheet. Finally, by forming the member to project partly towards the web the exposed portion of the adaptor and a fence panel using such an

adaptor have less sharp edges which may inadvertently cause injury to people, especially children.

If preferred two members one projecting from each side of the adaptor similar to that just described may be used. Likewise other forms of the member may be used and whilst not preferred the member may not extend continuously the length of the adaptor provided the sheets are secured.

Figure 2 illustrates the fence panel from a number of views. Figure 2(a) shows a side view which is substantially the same from either side. Figure 2(b) shows an end view whilst Figure 2(c) shows a top view and Figure 2(d) shows a bottom view. It will be noted that the bottom rail has holes (one shown as 14) to allow water to drain from the panel. Likewise the adaptor may be provided with drainage holes.

Figure 3 illustrates a horizontal cross sectional view of the fence panel. Figure 4 illustrates a vertical cross sectional view and the operation of the restraining means and the securing means.

The adaptor may be retro-fitted to existing fence rails of modular fence panels originally manufactured for use with wider sheets. By removing the top rail the old sheets can be removed. Into the bottom and top rails respective adaptors are inserted. The corrugated sheets are inserted into the side and bottom rails by pushing the sheets against the biased member which resiliently moves away. Then the top rail is pushed onto the top edge of the sheets and secured to the side rails.

In an alternative form an adaptor is inserted into the rails lengthwise. This requires both top and bottom rails being dismantled and reassembled but otherwise the method is substantially as just described.

In figure 6 the second embodiment is illustrated. It is similar to the first except as follows. The rails (15 and 16) are as before. The adaptors (17 and 18) folded and dimensioned to fit within the rails and are inserted lengthwise. Each adaptor is again substantially U shaped with a web (19) and spaced sides (20 and 21). From the spaced sides distal of the web project two members (two shown as 22 and 23) biased towards each other and directed towards the web. As before the members flex to allow ingress of an inserted sheet (24) and firmly press against the sheet to hold it in place. To complete the panel sides rails are used (one shown as 25) and each rail is secured by screws or bolts to each adjoining rail.

A third embodiment is illustrated in figure 7. Here the rail (26) is octagonal in cross sectional profile which provided additional rigidity compared with a C shaped rail. Again

the rail has an elongate gap (27) in a face (28) into which a sheet is inserted. The adaptor (29) is generally U shaped with to spaced sides (30 and 31) joined by a web (32). The sides are biased apart and angled relative to the web so that at distal the web they are spaced further apart. Projecting from each side are members (33 and 34) biased towards each other and slightly towards the web. Each member has a rounded lip (one shown as 35) which provides a rounded smooth bent over edge to a sheet and so protects the sheet from damage due to scratches and the like during sheet insertion. The adaptor is inserted lengthwise into the rail and is dimensioned to that the outer surfaces (36 and 37) press against the internal surfaces of the rail generally at bends (38 and 39). This assist with retaining the adaptor within the rail.

The embodiment illustrated in figure 8 is similar to those just described excepting that the panel is has the corrugations running horizontally rather than vertically. This is achieved by essentially rotating the panel by 90° compared with those previously described. It will be appreciated that lengths of rails are adjusted to suit the sheets in this configuration and that the side rail now forming being lowermost would have drainage holes provided.

The last illustrated embodiment is shown in figure 9. In this embodiment the rail and adaptor of previous embodiments are combined. Each fence rail (40 and 41) is hollow with an elongate gap (one shown as 42) to permit edgewise insertion of the edge of the sheet (43). Each rail has two opposed sides (two shown as 44 and 45) joined by a web (one shown as 46) and two elongate members (two shown as 47 sand 48).

Completing the panel are side rails one shown as (49).

The elongate members extend the length of the rail. The members are directed inwardly and towards the web. The members are biased towards each other and flex about the join with the respective side.

The rails are rolled, or folded or other known manufacturing techniques known to the art from 1.3 mm steel which is sufficiently strong to support by the edges a panel of 1500 mm and 1800 mm. Corrugated sheets may be 0.3 mm thick with a corrugation to corrugation thickness of 16mm. The corrugated sheet may be pushed against the members to effect insertion into the rail. It will be appreciated that the thicker the material used to make the rail then the more rigid the members and greater force required to insert the sheet.

At intervals along the bottom rail (40) are drainage holes (50) which allow water to drain from the rail. Rain water, for example, may run down the sheet into the rail and wet conditions may favour corrosive conditions within the rail so making it desirable to drain the water.

In a slightly different form, the rails (40 and 41) have member flexure enhancement means which permits the members to flex under the influence of less force than would otherwise be required. This can allow thicker material be used for the rail and so provide greater overall strength to the panel yet still enable sheets to be inserted.

In one form, the bend (one shown as 51) which joins the member to a respective side notched at intervals. These notches may be rectangular 5 mm deep and 25 mm long with centre spacings of 75 mm. The effect of the notches is to reduce the rigidity of the members allowing them to be more easily flexed during insertion of sheets.

It will be appreciated that whilst the invention is conceived as finding application to corrugated sheets the invention may also be used with other profiled sheets. Further, it will be appreciated that this disclosure is not intended to limit the invention to preferred embodiments or details thereof. Other embodiments will readily be conceived by a skilled addressee and as such these would all fall within the spirit of the invention disclosed herein.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An adaptor for a fence rail, the adaptor having restraining means to restrain movement of the adaptor transverse of a sheet plane of the fence rail when the adaptor is inserted into the fence rail, and securing means to restrain movement of a sheet inserted into the fence rail within the sheet plane transverse the sheet plane.

2. An adaptor as in Claim 1 wherein the restraining means includes two spaced surfaces adapted to bear against two spaced sides of a fence rail.

3. An adaptor as in Claim 2 wherein the two spaced surfaces are opposed and substantially parallel and are adapted to bear against two opposed spaced sides of a fence rail that are substantially parallel to the sheet plane of the fence rail.

4. An adaptor as in either Claim 2 or 3 wherein the adaptor is adapted to be inserted lengthwise into a fence rail and the two spaced surfaces to bear against internal sides of the fence rail.

5. An adaptor as in either Claim 2 or 3 wherein the adaptor is adapted to be inserted into an elongate gap within a face of a fence rail, the channel being formed by to inwardly directed surfaces of the rail against which the two spaced surfaces bear.

6. An adaptor as in any one of the preceding claims wherein the securing means includes at least one elongate member parallel to an elongate axis of the adaptor that project and is biased towards the sheet plane of a fence rail when the adaptor is inserted into the fence rail and adapted thereby to bear against a sheet inserted into the fence rail within the sheet plane.

7. An adaptor as in Claim 1 having a generally U shaped cross sectional profile, the restraining means includes two opposed spaced surfaces parallel to an elongate axis of the adaptor and joined by a web at one end and open at the other end, and the two opposed sides being biased apart at the open end.

8. An adaptor as in Claim 7 wherein the securing means includes at least one member projecting from a one of the two opposed spaced surfaces distal the web and biased towards the other one of the two opposed spaced surfaces, the member being adapted that when a sheet is inserted into an adaptor inserted within a fence rail the member bears against the sheet lying in the sheet plane.

9. An adaptor as in claim 8 wherein both opposed spaced surfaces have projecting members.

10. An adaptor as in either claim 8 or 9 wherein the member or members also project towards the web and thereby is adapted to resist removal of an inserted sheet within the adaptor.

11. An adaptor as in any one of claims 8, 9 or 10 wherein the member or members each has a lip innermost of the adaptor which is bent over to present a rounded smooth edge to bear against a sheet.

12. An adaptor as in either claim 1 or 2 wherein the securing means includes at least one elongate member parallel to an elongate axis of the adaptor that project and is biased towards the sheet plane of a fence rail when the adaptor is inserted into the fence rail, being octagonal in cross sectional profile, and adapted thereby to bear against a sheet inserted into the fence rail within the sheet plane.

13. A modular fence panel including an open hollow side rail at each side edge of the panel and a fence rail at top and bottom edges of the panel, an adaptor inserted within each the fence rail, at least one sheet inserted edgewise by its periphery into the side rails and the adaptors within the fence rails, the adaptor having restraining means to restrain movement of the adaptor within a respective fence rail transverse the sheet plane of the fence rails and securing means to restrain movement of the sheet transverse the sheet plane, and each rail being affixed to adjacent rails.

14. A modular fence panel as in Claim 13 wherein the restraining means includes two spaced surfaces that bears against two spaced sides of the respective fence rail.

15. A modular fence panel as in Claim 14 wherein the two spaced surfaces are opposed and substantially parallel and bear against two opposed spaced sides of the respective fence rail that are substantially parallel to the sheet plane.

16. A modular fence panel as in either claim 14 or 15 wherein the securing means includes at least one elongate member parallel to an elongate axis of the adaptor that is biased towards the sheet plane of the respective fence rail bear against the sheet.

17. A modular fence panel as in any one of claims 13, 14, 15 or 16 wherein the adaptor is one having a generally U shaped cross sectional profile, the restraining means includes two opposed spaced surfaces parallel to an elongate axis of the adaptor and joined by a web at one end and open at the other end, the two opposed sides being biased apart at the open end, and the adaptor being adapted to be inserted web first into a respective fence rail transverse the elongate axis of the fence rail and with the two opposed spaced surfaces bearing against two opposed spaced sides of the respective fence rail that are substantially parallel to the sheet plane.

18. A modular fence panel as in Claims 17 wherein the securing means includes at least one member projecting from a one of the two opposed spaced surfaces distal the web and biased towards the other one of the two opposed spaced surfaces, and the member bears against the sheet.

19. A modular fence panel as in Claim 18 wherein the both opposed spaced surfaces have projecting members.

20. A modular fence panel as in either claim 18 or 19 wherein the member or members also projects towards the web and thereby is adapted to resist removal of the sheet.

21. A modular fence panel as in either claim 13 or 14 wherein the fence rails are octagonal in cross sectional profile, the securing means includes at least one elongate member parallel to an elongate axis of the adaptor that project and is biased towards the sheet plane and adapted thereby to bear against the sheet.

22. A modular fence panel as in any one of claims 18, 19 or 20 wherein the member or members each has a lip innermost of the adaptor which is bent over to present a rounded smooth edge to bear against a sheet.

23. A method of retro-fitting new sheets into a modular fence panel for which the original sheets had a depth greater than the new sheets, the method including removing the top fence rail, removing the original sheet or sheets, inserting an adaptor into the top and bottom rails, inserting the new sheet or sheets edgewise into the adaptor of the bottom rail, and re-installing the top rail.

24. A method of retro-fitting new sheets into a modular fence panel as in Claim 23 including the steps of removing the bottom fence rail, re-installing the bottom rails, and inserting the adaptor lengthwise into the top and bottom fence rails prior to re-installation.

25. A fence rail including an elongate gap for acceptance of an edge of a sheet, and securing means adapted to permit insertion of a sheet edgewise and cramp against the opposed sides of the sheet to thereby secure the sheet within the rail.

26. A fence rail as in claim 25 wherein the securing means includes at least one elongate member parallel to an elongate axis of the rail and is biased towards the sheet plane of rail and adapted thereby to bear against a sheet inserted into the rail within the sheet plane.

27. A fence rail as in either claim 25 or 26 generally U shaped cross sectional profile having two opposed spaced surfaces parallel to the elongate axis of the rail and joined by a web at one end and open at the other end, at least one member projecting from a one of the

two opposed spaced surfaces distal the web and biased towards the other one of the two opposed spaced surfaces, the member being adapted that when a sheet is inserted into the rail the member bears against the sheet lying in the sheet plane.

28. A fence rail as in claim 27 wherein both opposed spaced surfaces have projecting members.

29. A fence rail as in either claim 27 or 28 wherein the member or members also projects towards the web and thereby are adapted to resist removal of an inserted sheet within the adaptor.

30. A fence rail as in any one of claims 27, 28 or 29 wherein the member or members each has a lip innermost of the rail which is bent over to present a rounded smooth edge to bear against a sheet.

31. A fence rail as in any one of claims 26, 27, 28, 29 and 30 wherein the rail includes member flexure enhancement means adapted to reduce the rigidity of each member relative to the respective side to which it is joined.

32. A fence rail as in any one of claims 25, 26, 27, 28, 29, 30 and 31 wherein the rail includes drainage holes adapted such that when the rail is lowermost in a panel water collecting in the rail may drain therefrom.

33. An adaptor for a fence rail substantially as herein described with reference to the accompanying drawings.

34. A modular fence panel substantially as herein described with reference to the accompanying drawings.

35. A method of retro-fitting new sheets into a modular fence panel substantially as herein described with reference to the accompanying drawings.

36. A fence rail substantially as herein described with reference to figure 9.

Dated this 7th day of October 1999

KERRY ANTHONY HANDLEY, MICHAEL HALLION and CON MICHALIADIS
By their Patent Attorneys,
A. P. T. PATENT AND TRADE MARK ATTORNEYS

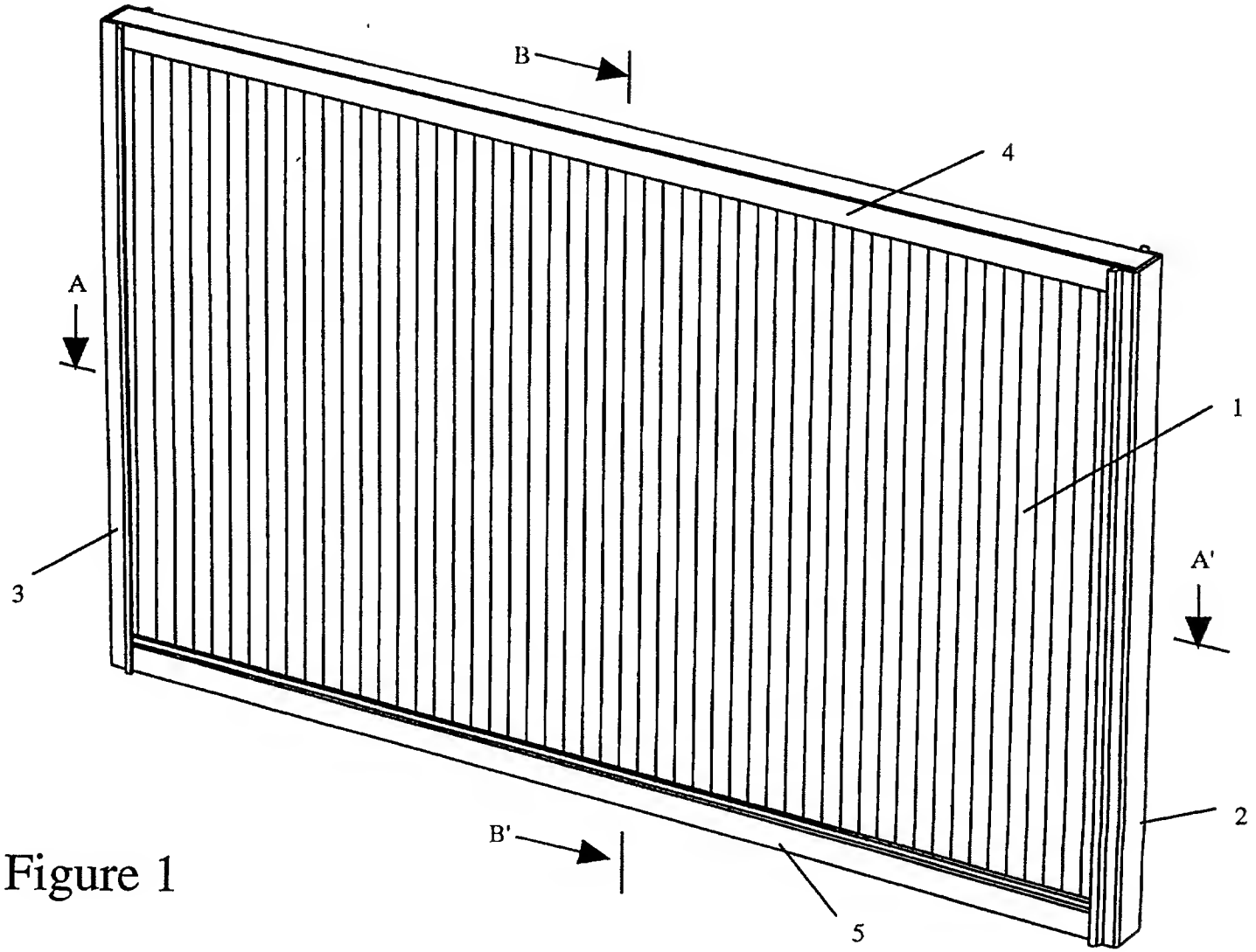


Figure 1

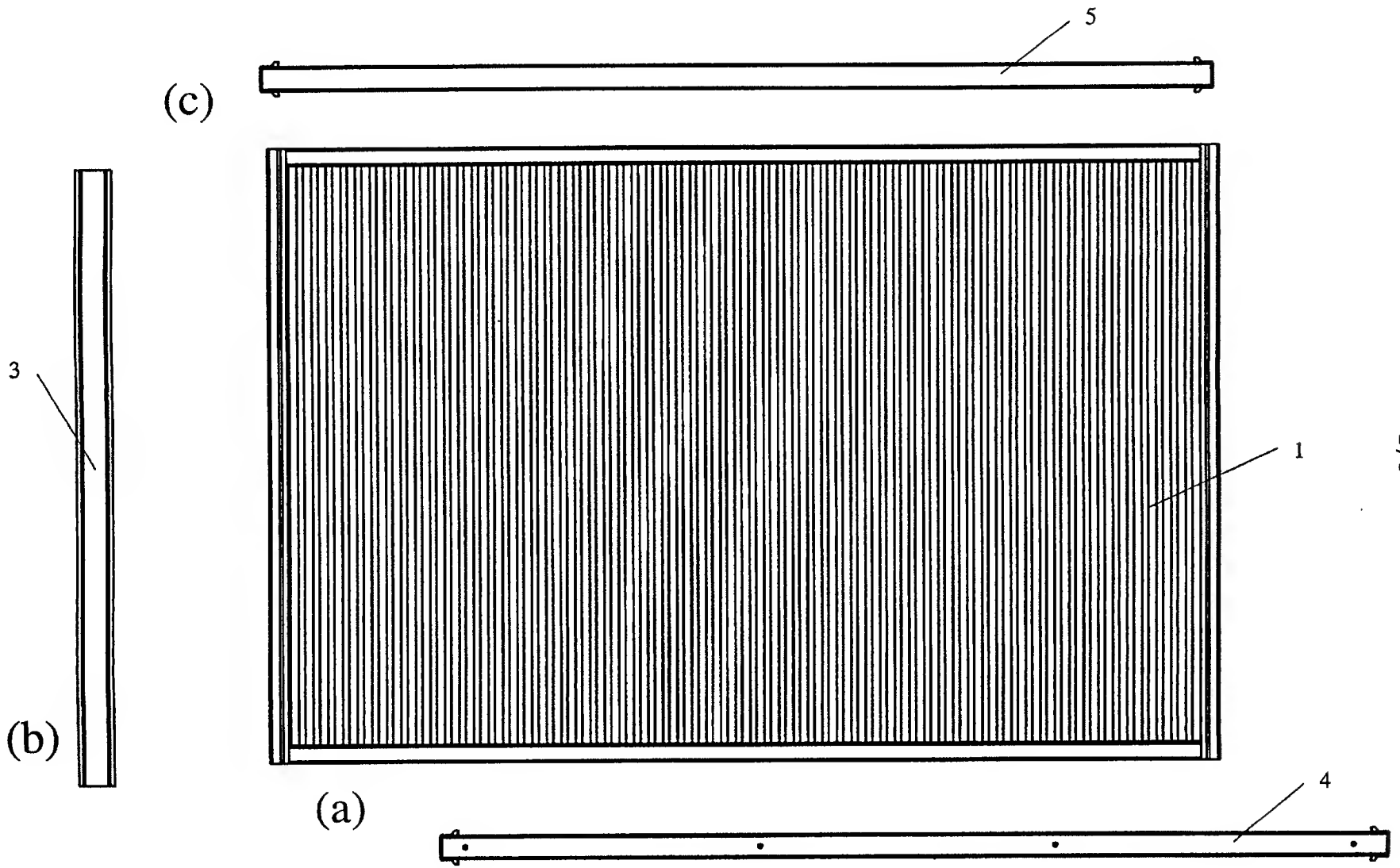


Figure 2

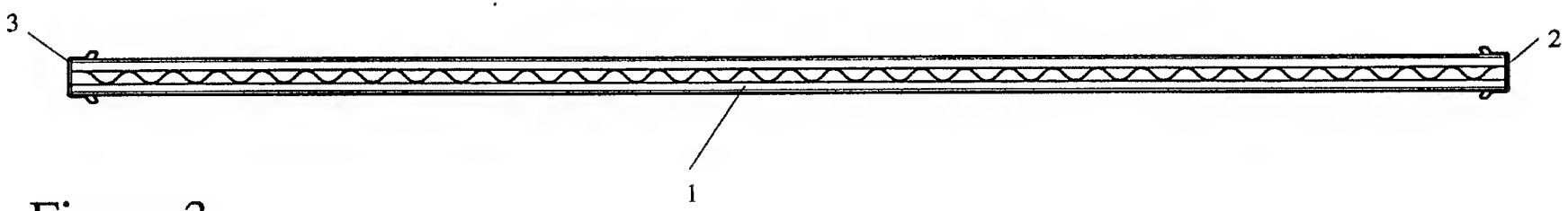


Figure 3

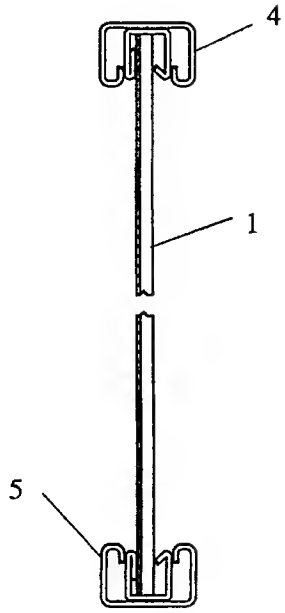


Figure 4

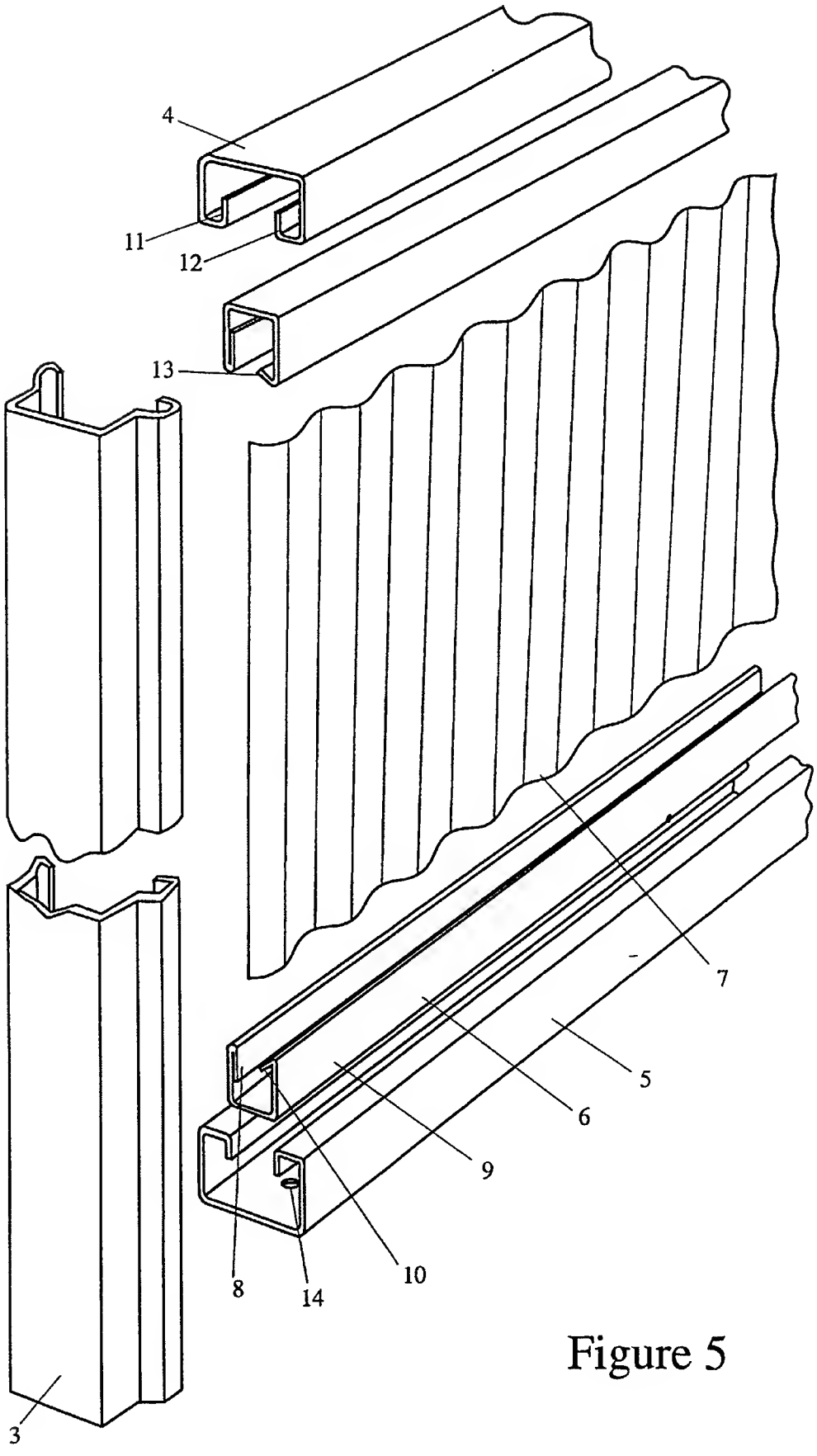


Figure 5

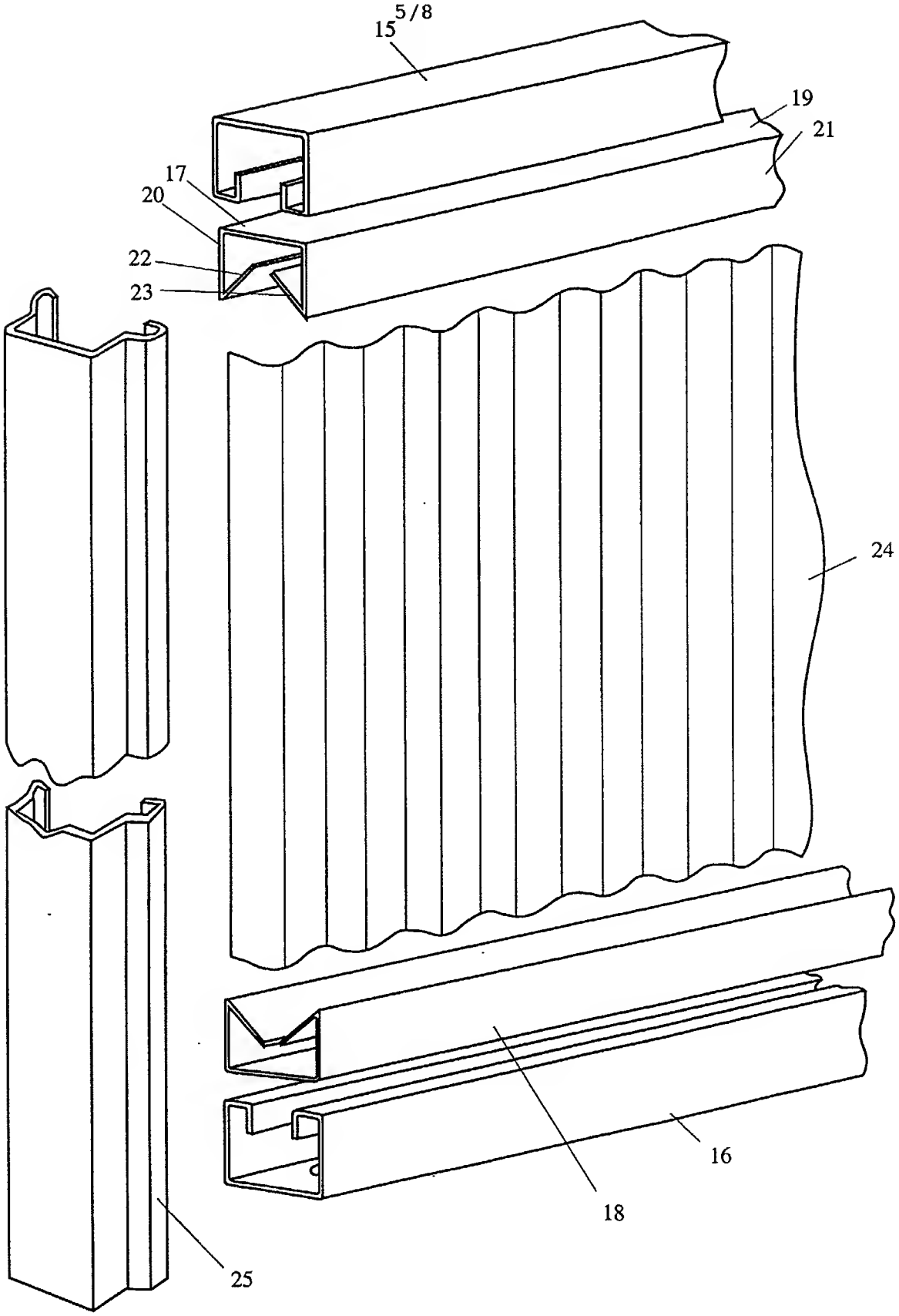
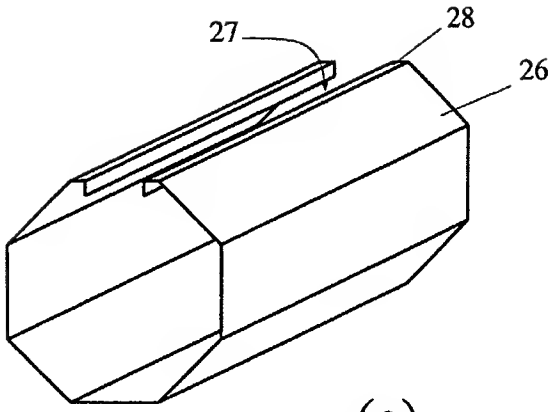
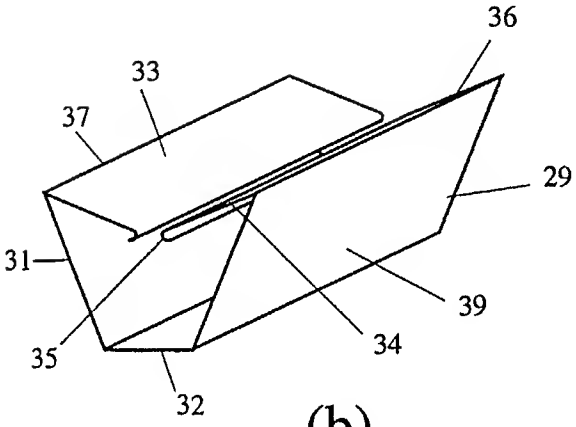


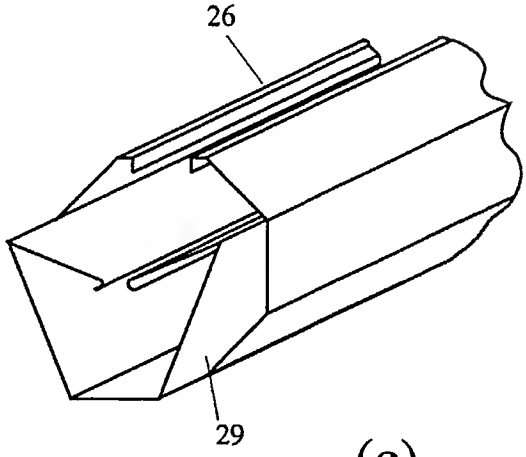
Figure 6



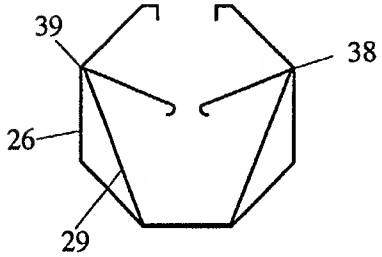
(a)



(b)



(c)



(d)

Figure 7

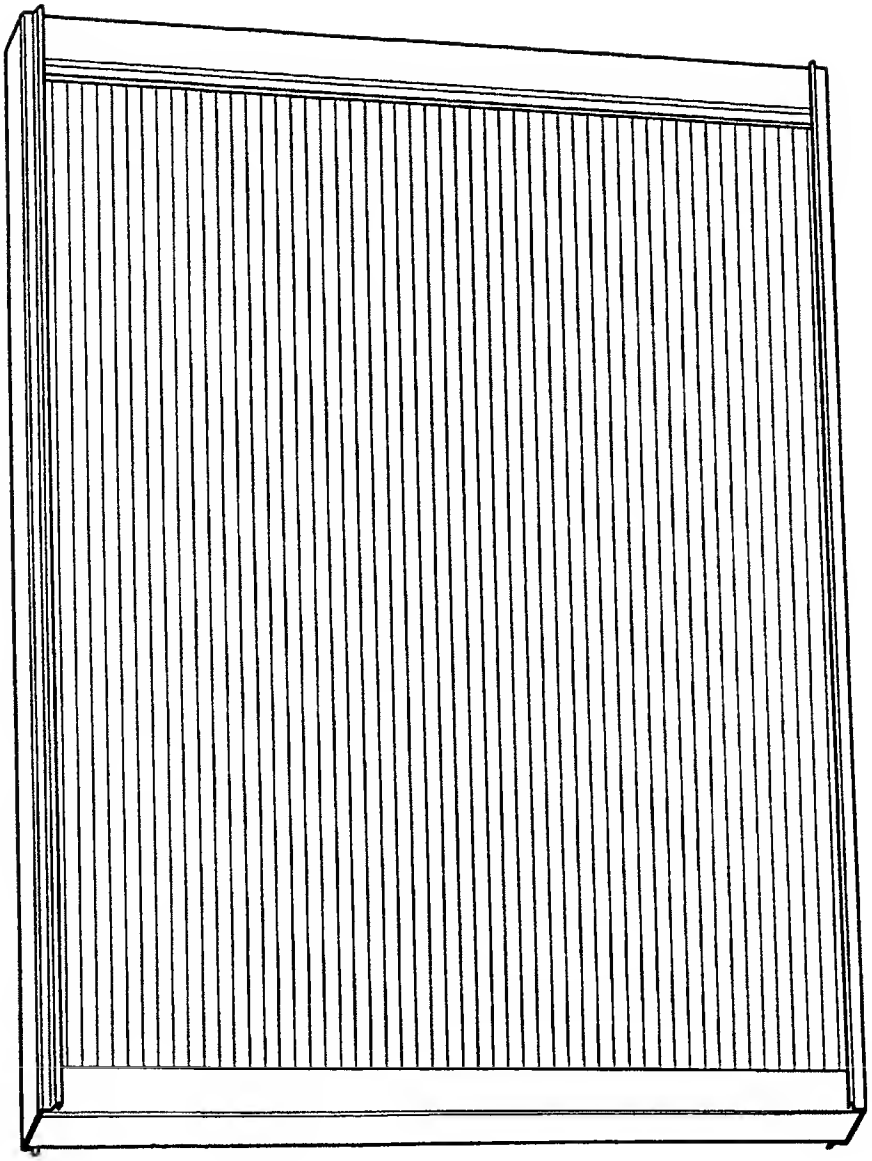


Figure 8

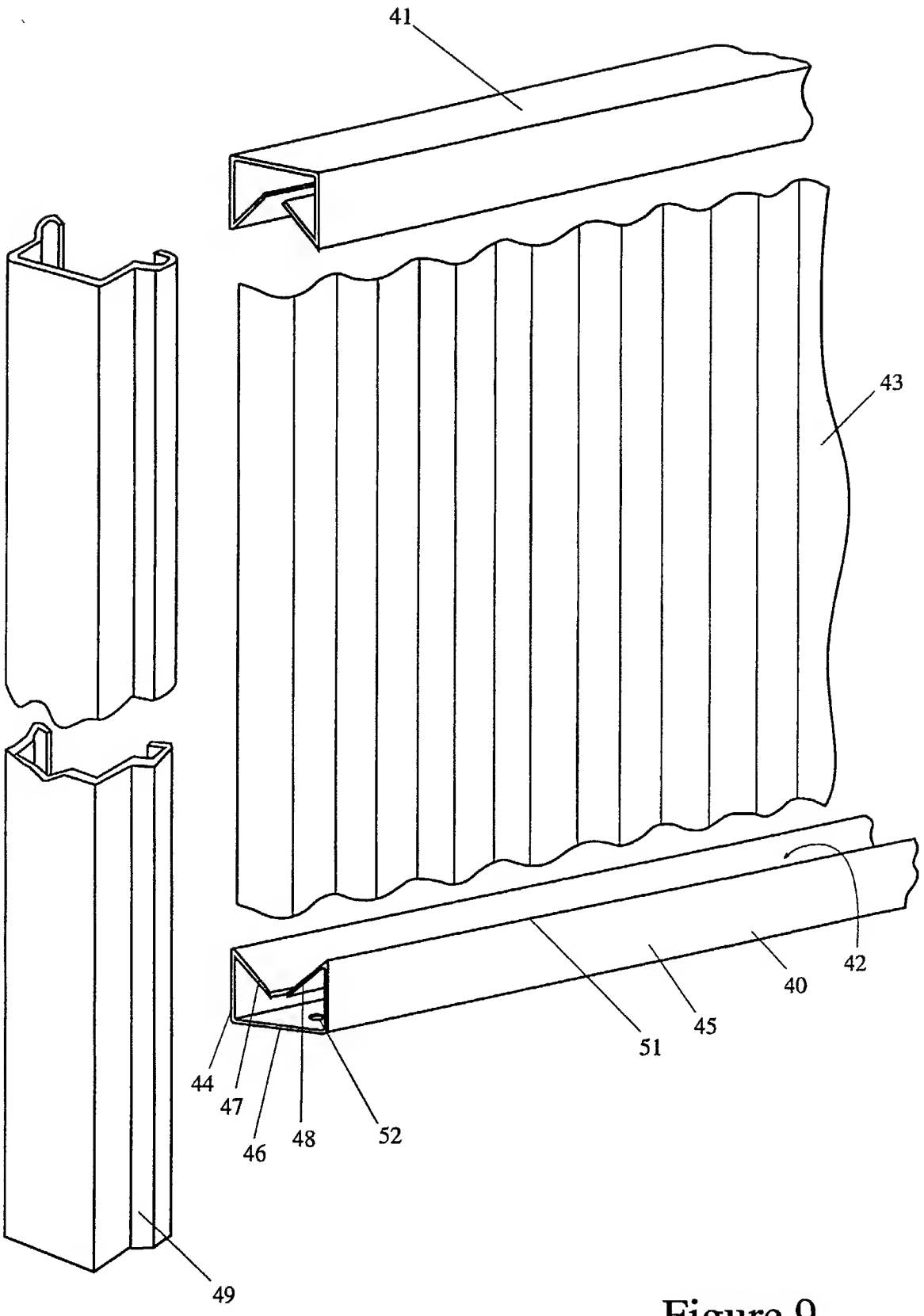


Figure 9